IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln of:	BERGANO, Neal S.	Atty. Docket No.:	TCM137CON3
Title:	SYNCHRONOUS AMPLITUDE MODULATION FOR IMPROVED PERFORMANCE OF OPTICAL TRANSMISSION SYSTEMS		
Serial No.:	10/780,830	Art Unit:	2613
Filed:	February 18, 2004	Examiner:	Wang, Quan Zhen
Customer No.:	32047	Confirmation No.:	3768

Mail Stop: Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 CFR 1.131

Sir:

I, Neal S. Bergano, as the sole inventor in the subject application, do hereby declare that:

1. Independent claim 1 of the present application reads as follows:

> 1. An apparatus for transmitting an optical signal comprising:
> an optical signal source configured to generate an optical signal;
> a data modulator coupled to said optical signal source and configured to modulate data on said optical signal at a data modulation frequency; and
> an amplitude modulator coupled to said optical signal source and configured to provide a periodic modulation of the intensity of said optical signal.

2. Independent claim 56 of the present application reads as follows:

> 56. A method of modulating an optical signal for transmission on an optical communication system, said method comprising:
> modulating data on said optical signal at a data modulation frequency; and
> imparting a periodic amplitude modulation on said optical signal.

3. Independent claim 74 of the present application reads as follows:

> 74. A transmission system comprising:
> a transmitter including:
> an optical signal source configured to generate an optical signal,
> a data modulator coupled to said optical signal source and configured to modulate data on said optical signal at a data modulation frequency, and
> an amplitude modulator coupled to said optical signal source and configured to provide a periodic modulation of the intensity of said optical signal;
> an optical transmission path coupled to said transmitter; and
> a receiver coupled to the optical transmission path.

4. An actual laboratory transmission demonstration including the subject matter of independent claims 1, 56 and 74 was constructed and observed to work for its intended purpose prior to December 4, 1996.

5. Exhibit A is a true copy, with certain information redacted, of sheets 1-3 of a report of the performance of the laboratory transmission demonstration.

6. The sheets attached as Exhibit A were created prior to December 4, 1996.

7. In the laboratory transmission test reported in Exhibit A, 10 channels (i.e. 10 optical signals, each at a different wavelength and each operating at 10Gb/s data rate) were actually transmitted over a 5000 km distance to a receiver.

8. As indicated in the "Transmission Testing" section on page 2 of Exhibit A, the transmitted optical signals were generated using a non-return-to-zero (NRZ) data modulation format and "The NRZ pulses were converted to RZ using an additional amplitude modulator before the polarization scrambler."

9. Figure 3 on page 2 of Exhibit A is a "transmitted eye diagram", showing a periodic amplitude modulation of the intensity of the transmitted optical signals established by the "additional amplitude modulator."

10. Figure 4 on page 3 of Exhibit A shows "the measured Q-factor and corresponding BERs for all 10 channels" over the 5000 km distance. The laboratory transmission demonstration including the "additional amplitude modulator" provided an average Q factor ranging from 13.7 dB to 15.8 dB, as reported in the "Transmission Testing" section on page 2 of Exhibit A.

11. Being hereby warned that willful false statements are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any resulting Letters Patent issuing thereon, I state that all statements made of my own knowledge are true and all statements made on information and belief are believed to be true.

Respectfully submitted,

Date: May 14 2007

Neal S. Bergano

subject: 10 x 10 Gb/s Loop Experiments Update

date:

from: **Neal S. Bergano**

Transmission Testing - Preliminary 10 channel 10 Gb/s transmission experiments were performed at 5000 km using raised cosine RZ pulses with synchronous polarization scrambling. Figure 3 shows a transmitted eye diagram. The NRZ pulses were converted to RZ using an additional amplitude modulator before the polarization scrambler. Figure 4 shows the measured Q-factor and corresponding BERs for all 10 channels. The Q-factors ranged from 13.7 dB to 15.8 dB, with an average value of 14.9 dB. As expected the channels closest to the zero dispersion wavelength of 1558.7 nm performed the best. The noise-only analysis predicts a Q-factor of about 17.9 dB (for a large back-to-back Q-factor), or 7 dB (assuming a back-to-back Q-factor of 24 dB). Thus, on average we are seeing a dispersion/nonlinear impairment penalty of about 2 to 4 dB.

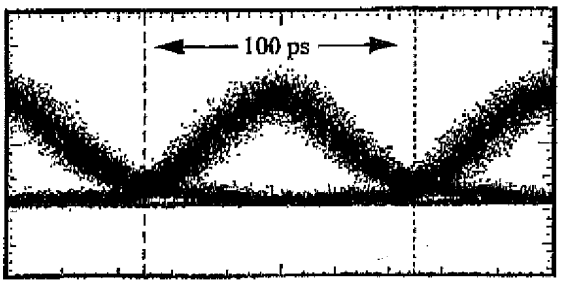

Figure 3 - Transmitted eye diagram (note: the waveform was recorded with ~25 GHz bandwidth).

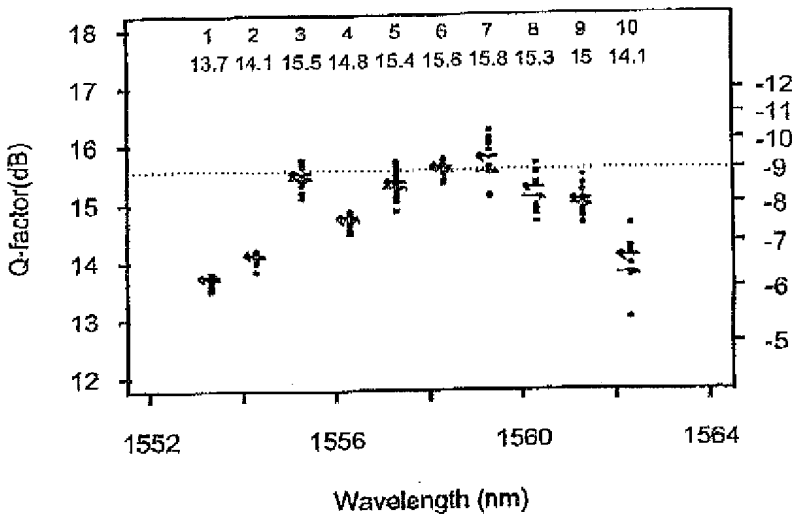

Figure 4 - Q-Factor and corresponding BER for 10x10Gb/s over 5000 km.